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Department of Patents.
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No. 12,453/28.

APPLICATION DATED

23rd March, 1928.

Applicant .. .. HENRY HERSCHEL BASS.
Application and Provisional Specification .. Accepted, 5th April, 1928.
Application and Complete Specification .. Accepted, 12th February, 1929.
Acceptance Advertised (Sec. 50) .. 26th February, 1929.

Class 31.7.

No drawing.

COMPLETE SPECIFICATION.

"Improvements in or relating to the manufacture of fertilisers."

I, HENRY HERSCHEL BASS, Chemist, Care of the Distillers Agency, 455 Latrobe Street, Melbourne, in the State of Victoria, and Commonwealth of Australia, hereby declare this invention, and the manner in which it is to be performed, to be fully described and ascertained in and by the following statement:—

This invention relates to the production of fertilising material and its general object is to utilise distillery waste, such as spent wash, distillery slop, or like distillery residues.

This invention is of even more special importance when applied to the treatment of wastes of this kind which have been derived from sugar cane.

In the past attempts have been made to form fertilisers by treatment of vinasses from beet: but the large quantities of materials, such as binders and superphosphates, which were added in those treatments, resulted in low grade fertilisers containing a great excess of phosphoric acids. Further, owing to the considerably lower percentages of potash and nitrogen in sugar cane residues as compared with beet residues the above methods would be uneconomical and impractical if applied to sugar cane residues.

The specific object of the present invention is to produce a stable, dry and non-hygroscopic fertiliser and in its broad feature comprises the treatment of distillery waste, especially concentrated distillery slop, with finely-ground phosphatic material and sulphuric acid with or without subsequent drying. The hot concentrated slop may be treated with the phosphatic material and then with the sulphuric acid or, alternatively, the acid may be added first, followed by the phosphate, or the two additions may be made simultaneously. Owing to the exothermic reaction between the phosphate and the sulphuric acid a considerable amount of heat is developed and, moreover, the calcium sulphate formed in the reaction will absorb water in assuming the hydrated form, consequently a considerable amount of the water present in the slop will be evaporated or absorbed and the amount of subsequent drying of the product will be considerably reduced or altogether eliminated. Moreover, owing to the heat developed by the chemical reactions and probably also owing to chemical action between the reacting bodies and the organic matter, this organic matter in the slop is converted into a form which is non-hygroscopic after drying. In order to produce fertilisers of any desired composition in nitrogen, potash or phosphoric acid, other fertilising elements, such for example as ammonium sulphate or potassium salts, can be added during the mixing with the phosphate and acid.

The following examples illustrate how the invention may be carried into effect:—

1. Distillery slop is concentrated to a density of about 30 Be. and while still hot is mixed with about 1/12th part by weight of Nauru phosphate rock, after which 1/12th

464.—12/3/29.—100.—Price, 1s. 6d. post free.

part by weight of sulphuric acid of 66 Be. is mixed in. The mixture is thoroughly stirred for 30-60 minutes. The mixed product is then dried by any known means. Waste flue gases may be used as a drying agent and the drying may be conveniently carried out at a temperature of about 135°C.

2. Distillery slop concentrated to a gravity of 28-30 Be, is mixed with 1/6th of its weight of Nauru phosphate rock and 1/12th part by weight of sulphuric acid is then added with the simultaneous addition of 1/6th part by weight ammonium sulphate. The mixture is well stirred for 30-60 minutes and, if necessary, is subsequently dried as in the above example. A neutral non-hygroscopic fertiliser containing nitrogen, potash and phosphoric acid is obtained.

3. Distillery slop concentrated to 25-30 Be. is mixed with ½ its weight of Nauru phosphate rock, ¼ by weight of concentrated acid being simultaneously added. The mixture is stirred for 30-60 minutes and, if necessary, subsequently dried as before.

The above are given by way of examples only and the proportions of slop, phosphatic rock and sulphuric may be varied within wide limits according to the nature of the end product desired without departing from the scope of the invention. If a neutral end product in which the phosphate is present in the citrate soluble form is desired, the amount of acid added should not greatly exceed one-half the amount of phosphatic rock. If the proportions of acids and rock specified in the first example are used the final product may be slightly acid in reaction but will be a suitable fertiliser and will contain a large proportion of phosphoric acid soluble in water.

Products obtained can be applied to the fields directly. Normally the fertiliser will be produced in the locality where the cane or beet was cultivated, and, as the product will be used to a large extent locally, it will tend to return to the soil the same soil constituents as were removed from the soil by the growth of ~~the vegetation~~ Ammonium sulphate, potassium salts or superphosphate may of course be incorporated in the finished product to increase the proportion of any desired fertilising element, but it is preferable to add these during the mixing as specified above.

While specific examples have been given to illustrate the invention it is intended that modifications may be included within the broad scopes of the invention defined by the various claims.

Having now fully described and ascertained my said invention, and the manner in which it is to be performed, I declare that what I claim is:—

1. A process for the production of non-hygroscopic fertilisers from distillery waste characterised in that the hot partially concentrated waste is mixed with phosphatic rock and sulphuric acid with or without subsequent drying.

2. A process according to Claim 1 in which other fertilising elements are incorporated into the mixture during the manufacture.

3. A process according to Claim 1 in which the proportions of acid and phosphatic rock used are so adjusted that an end product rich in water soluble phosphoric acid is obtained.

4. A process according to Claim 1 in which the proportions of acid and phosphatic rock used are so adjusted that an end product rich in citrate soluble phosphoric acid is obtained.

5. A process for the production of non-hygroscopic fertilisers from distillery slop substantially as specified in Example 1.

6. A process for the production of non-hygroscopic fertilisers from distillery slop substantially as specified in Example 2.

7. A process for the production of non-hygroscopic fertilisers from distillery slop substantially as specified in Example 3.

8. A process, for the purpose specified, substantially as described.

9. Mixed fertilisers produced in accordance with any of the preceding claims.

Dated this 17th day of December, 1928.

L. B. Davies.

Patent Attorney for the Applicant.

Witness—E. V. Davies.

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